

IN THE CLAIMS:

Please amend the claims as follows:

1. (Amended) An apparatus for use in the detection of an analyte by electrochemiluminescence comprising a light detector and a support comprising an electrode capable of inducing electrochemiluminescence and a counterelectrode, said electrode [or counterelectrode] having immobilized on a surface thereof [a predetermined amount of] a binding reagent capable of binding [an] said analyte [electrochemiluminescent labelled species] or a binding partner of [an electrochemiluminescent labelled species] said analyte.

2. (Amended) An apparatus for use in the detection of an analyte by electrochemiluminescence comprising a light detector and an electrode capable of inducing electrochemiluminescence [and a counterelectrode], said electrode [or counterelectrode] having immobilized on a surface thereof [a predetermined amount of] a binding reagent capable of directly or indirectly binding [an electrochemiluminescent labelled species] said analyte or a binding partner of said analyte, wherein said electrode comprises carbon nanotubes, carbon black, carbon nanotubes in a matrix, carbon black in a matrix or combinations thereof.

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<sup>3</sup> 5. (Amended) An apparatus as recited in claim 2 [3]  
wherein said apparatus further comprises a [electrode is the]  
counterelectrode.

<sup>4</sup> 6. (Amended) An apparatus as recited in [claim 3] claims  
<sup>or</sup> <sup>1</sup> ~~1~~ <sup>2</sup> ~~or 8~~ wherein the immobilized reagent and electrode  
[complex is] are substantially permissive to electron transfer  
between said electrode and an electrochemiluminescent label.

<sup>5</sup> 7. (Amended) An apparatus as recited in claim [3] 2  
wherein said electrode is [comprised of a] porous [material].

<sup>6</sup> 8. (Amended) An apparatus for use in the detection of an  
analyte by electrochemiluminescence comprising a light detector  
and a porous [a working] electrode capable of inducing  
electrochemiluminescence [and a counterelectrode], said  
[working] electrode having immobilized on a surface thereof [and  
in electrochemical contact therewith, a predetermined amount of]  
a binding reagent capable of binding a component of a binding  
electrochemiluminescence assay.

<sup>7</sup> 11. (Amended) An apparatus for use in the detection of an  
analyte by electrochemiluminescence comprising a light detector  
and an electrode capable of inducing electrochemiluminescence [,  
a counterelectrode] and a porous matrix in electrochemical  
contact with said electrode or capable of being in  
electrochemical contact with said electrode, said porous matrix

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cont  
containing on a surface thereof [a predetermined amount of] a  
binding reagent capable of binding a component of a binding  
electrochemiluminescence assay.

9 17. (Amended) An apparatus for use in the detection of an  
analyte by electrochemiluminescence comprising:

(a) an electrode;  
  
(b) a support having immobilized thereon a plurality of  
discrete binding domains each containing [a predetermined amount  
of] a binding reagent capable of binding a component of a  
binding electrochemiluminescence assay; and

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(c) a light detector [a counterelectrode;  
(d) means for sample delivery to said binding domains;  
(e) means for triggering electrochemiluminescence; and  
(f) means for electrochemiluminescence detection].

20. (Amended) An apparatus as recited in [claim] claims  
1, <sup>7</sup> ~~8~~, <sup>11</sup> ~~11~~, <sup>21</sup> ~~19~~, <sup>31</sup> ~~30~~, <sup>37</sup> ~~30~~, <sup>34</sup> ~~31~~, <sup>35</sup> ~~32~~, <sup>36</sup> ~~33~~, <sup>37</sup> ~~34~~, <sup>38</sup> ~~35~~, <sup>39</sup> ~~36~~ or ~~37~~, wherein said  
electrode or said plurality of electrodes comprise [is comprised  
of] a carbonaceous material.

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14 22. (Amended) An apparatus as recited in claim <sup>9</sup> ~~17~~ wherein  
said [electrochemiluminescence detection means] light detector  
detects electrochemiluminescence from [one] two or more of said  
binding domains.

87 <sup>17</sup>25. (Amended) An apparatus as recited in claim <sup>9</sup>~~17~~ further comprising a counterelectrode, wherein said support is a porous matrix, said matrix being positioned between said electrode and said counterelectrode.

<sup>18</sup>27. (Amended) An apparatus as recited in claim [26] <sup>18</sup>~~17~~, wherein said light detector comprises a plurality of light detectors and said plurality of light detectors [means for electrochemiluminescence detection] is capable of imaging [used to image] one or more of said binding domains.

<sup>19</sup>28. (Amended) An apparatus as recited in claim <sup>18</sup>~~27~~ wherein at least one of said plurality of light detectors [detection means] detects electrochemiluminescence from one binding domain.

88 <sup>20</sup>29. (Amended) An apparatus as recited in claim <sup>18</sup>~~27~~ wherein said plurality of light detectors [means for electrochemiluminescence detection] is a CCD array or a diode array.

<sup>21</sup>30. (Amended) An apparatus for use in the detection of an analyte by electrochemiluminescence comprising a light detector and an electrode, said electrode having immobilized on a surface thereof a plurality of discrete binding domains, said binding domains being capable of binding a component of a binding electrochemiluminescence assay.

<sup>22</sup> ~~32.~~ (Amended) <sup>21</sup> The [An] apparatus of claim 30 [for use in the detection of an analyte by electrochemiluminescence comprising an electrode having immobilized on a surface thereof a plurality of discrete binding domains], wherein said discrete binding domains contain [containing] an electrochemiluminescent label.

<sup>23</sup> ~~35.~~ (Amended) <sup>9</sup> The [An] apparatus of claim 17 [for use in the detection of an analyte by electrochemiluminescence comprising an electrode and a support having immobilized on a surface thereof a plurality of discrete binding domains each containing a predetermined amount of a reagent capable of binding a component of a binding electrochemiluminescence assay], said electrode and said discrete binding domains being in electrochemical contact.

<sup>24</sup> ~~36.~~ (Amended) An apparatus as recited in claim [35] <sup>9</sup> ~~17~~ wherein the electrode is the working electrode.

<sup>25</sup> ~~37.~~ (Amended) An apparatus as recited in claim [35] <sup>9</sup> ~~17~~ wherein the electrode is the counterelectrode.

<sup>26</sup> ~~46.~~ (Amended) An article as recited in claim [45] <sup>5</sup> ~~7~~, wherein said porous material comprises carbon.

<sup>27</sup> ~~47.~~ An article as recited in claim [45] <sup>5</sup> ~~7~~, which said porous material comprises fibrils.

<sup>28</sup>~~61~~. (Amended) A kit for use in performance[, ] of a plurality of electrochemiluminescence assays for [a plurality of] analytes of interest comprising:

(a) an article comprising a plurality of discrete binding domains on a support, said binding domains having a relative spatial organization with respect to one another and at least two binding domains having different binding specificities for [a plurality of different] analytes of interest in an electrochemiluminescence assay; and

B12 (b) [a vessel containing] a reagent comprising an electrochemiluminescent label [necessary for the conduct of said assays].

<sup>29</sup>~~62~~. (Twice Amended) A kit as recited in claim <sup>28</sup>~~61~~ further including an electrode [apparatus for performing said assays].

<sup>30</sup>~~63~~. (Amended) A kit for use in performance [, ] of a plurality of electrochemiluminescence assays for a plurality of analytes of interest comprising:

(a) an article comprising a plurality of discrete binding domains on an electrode, said binding domains having a relative spatial organization with respect to one another and at least two binding domains having different binding specificities for analytes of interest in an electrochemiluminescence assay; and

(b) a reagent comprising an electrochemiluminescent label

B12  
cont

[a vessel containing binding components specific for a plurality of different analytes for use in a plurality of electrochemiluminescence assays].

31 78. (Amended) A system for conducting a plurality of electrochemiluminescence assays comprising:

(a) a plurality of discrete binding domains specific for a plurality of different analytes;

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(b) a voltage waveform generator; and

(c) a light detector capable of simultaneously detecting light from more than one binding domain [photon detection means].

Please cancel claims ~~3-4~~, ~~10~~, ~~12-16~~, ~~26~~, ~~31~~, ~~33-34~~, ~~38-45~~, ~~48-60~~, ~~64-77~~ and ~~79~~ without prejudice or disclaimer and add the following claims:

32 80. An apparatus for use in the detection of an analyte by electrochemiluminescence comprising:

(a) a support having a plurality of discrete binding domains thereon;

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(b) an electrode capable of inducing electrochemiluminescence, wherein said plurality of discrete binding domains and said electrode are capable of being brought into proximity;

- (c) a source of electrical energy for generating electrochemiluminescence; and
- (d) a light detector.

33 ~~81~~. An apparatus for use in the detection of an analyte by electrochemiluminescence comprising:

- (a) a support having a plurality of discrete binding domains thereon, wherein said support comprises an electrode for generating electrochemiluminescence;
- (b) a source of electrical energy for generating electrochemiluminescence; and
- (c) a light detector.

34 ~~82~~. An apparatus for use in the detection of an analyte by electrochemiluminescence comprising:

- (a) a cassette, wherein said cassette comprises an electrode and a plurality of discrete binding domains, wherein one or more binding domains contain binding reagents of specificity different from other binding domains;
- (b) a receptacle for said cassette;
- (c) a source of electrical energy for generating electrochemiluminescence; and
- (d) a light detector.



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~~83~~. A apparatus for use in the detection of an analyte by electrochemiluminescence comprising:

(a) a plurality of discrete binding domains immobilized on a support; and

(b) a plurality of electrodes capable of inducing electrochemiluminescence, wherein said binding domains are spatially aligned with said plurality of electrodes.

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~~84~~. An apparatus for use in the detection of an analyte by electrochemiluminescence comprising a plurality of electrodes capable of inducing electrochemiluminescence and a light detector, said electrodes having immobilized on surfaces thereof binding reagents capable of binding components of a binding electrochemiluminescence assay.

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~~85~~. An apparatus for use in the detection of an analyte by electrochemiluminescence comprising a light detector, a plurality of electrodes capable of inducing electrochemiluminescence and a plurality of discrete binding domains proximate said electrodes, said plurality of electrodes being capable of inducing electrochemiluminescence from at least one binding domain, each binding domain having an amount of binding reagent capable of binding a component of a binding electrochemiluminescence assay.

<sup>38</sup>  
~~86~~. An apparatus for generating electrochemiluminescence comprising:

- (a) a support;
- (b) an electrode on said support having a plurality of discrete binding domains immobilized thereon;
- (c) a counterelectrode on said support; and
- (d) a light detector.

<sup>39</sup>  
~~87~~. An apparatus for generating electrochemiluminescence comprising:

- (a) a support;
- (b) a plurality of electrodes on said support, said electrodes having binding domains immobilized thereon;
- (c) a counterelectrode on said support; and
- (d) a light detector.

<sup>40</sup>  
~~88~~. The apparatus of claims <sup>9 32 33 34</sup> ~~17, 80, 81 or 83~~, wherein said support further comprises a counterelectrode.

<sup>41</sup>  
~~89~~. The apparatus of claims <sup>7 8 9 21 32 33</sup> ~~1, 2, 8, 11, 17, 30, 80, 81,~~  
<sup>34 35 36 37 38 39</sup> ~~82, 83, 84, 85, 86 or 87~~, further comprising an electrochemiluminescent moiety.

<sup>42</sup>  
~~90~~. The apparatus of claims <sup>7 8 9 21 32 33</sup> ~~1, 2, 8, 11, 17, 30, 80, 81,~~  
<sup>34 35 36 37 38 39</sup> ~~82, 83, 84, 85, 86 or 87~~, further comprising an electrochemiluminescent moiety containing an organometallic compound.

43 <sup>7 8 9 21 32 33</sup> 91. The apparatus of claims 1, 2, ~~9~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~,  
<sup>24 25 26 27 28 29</sup> ~~82~~, ~~83~~, ~~84~~, ~~85~~, ~~86~~ or ~~87~~, further comprising an  
electrochemiluminescent moiety containing a Ru-containing or Os-  
containing organometallic compound. <sup>37</sup>

44 <sup>9 21 32 33 34 35 36 37</sup> 92. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said plurality of discrete binding domains is in  
a range of from 5 through 1000 binding domains. <sup>37</sup>

45 <sup>9 21 32 33 34 35 36 37</sup> 93. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said plurality of discrete binding domains is in  
a range of from 50 through 500 binding domains. <sup>37</sup>

46 <sup>9 21 32 33 34 35 36 37</sup> 94. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said plurality of discrete binding domains is in  
a range of from 5 through 50 binding domains. <sup>37</sup>

47 <sup>9 21 32 33 34 35 36 37</sup> 95. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said plurality of discrete binding domains  
includes greater than 50 binding domains. <sup>37</sup>

48 <sup>9 21 32 33 34 35 36 37</sup> 96. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said binding domains are in a size range of from  
0.001 to 1 mm in diameter or width. <sup>37</sup>

49 <sup>9 21 32 33 34 35 36 37</sup> 97. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup> or ~~87~~, wherein said binding domains are in the range of about  
0.001 mm to about 0.01 mm in dimension. <sup>37</sup>

<sup>7 8 34</sup>  
50 ~~98~~. The apparatus of claims 1, 2, ~~8~~, ~~11~~ or ~~84~~, wherein  
said binding reagent is immobilized through hydrophobic  
interaction.

<sup>9 21 32 33 34 35 37 38</sup>  
51 ~~99~~. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup>  
or ~~87~~, wherein said binding domains are immobilized through  
hydrophobic interaction.

<sup>7 8 36</sup>  
52 ~~100~~. The apparatus of claims 1, 2, ~~8~~, ~~11~~ or ~~84~~, wherein  
said binding reagents are immobilized by covalent bonding.

<sup>9 21 32 33 34 35 37 38</sup>  
53 ~~101~~. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup>  
or ~~87~~, wherein said binding domains are attached by covalent  
bonding.

<sup>7 8 9 36</sup>  
54 ~~102~~. The apparatus of claims 1, 2, ~~8~~, ~~11~~, ~~17~~ or ~~84~~, wherein  
said binding reagent comprises proteins or fragments or  
derivatives thereof.

<sup>21 32 33 34 35 37 38</sup>  
55 ~~103~~. The apparatus of claims ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~ or  
<sup>39</sup>  
~~87~~, wherein said binding domains include binding reagents  
comprising proteins or fragments or derivatives thereof.

<sup>9 21 32 33 34 35 37 38</sup>  
56 ~~104~~. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup>  
or ~~87~~, wherein said binding domains are located on a transparent  
gold film surface.

<sup>9 21 32 33 34 35 37 38</sup>  
57 ~~105~~. The apparatus of claims ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~  
<sup>39</sup>  
or ~~87~~, wherein said binding domains comprise patterned,  
self-assembled monolayers.

<sup>58</sup> 106. The apparatus of claims <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~, <sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~  
or <sup>39</sup> ~~87~~, wherein said binding domains comprise patterned,  
self-assembled monolayers and said patterned self-assembled  
monolayers comprise alkane thiol.

<sup>59</sup> 107. The apparatus of claims <sup>9</sup> ~~17~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~, <sup>34</sup> ~~82~~, or <sup>35</sup> ~~83~~, wherein  
said binding domains are formed by a method comprising the steps  
of:

- (a) linking a group A to at least one binding domain on said  
support, said group A capable of specifically binding to a  
second group B; and
- (b) contacting said group A with said group B, said group B  
being bound to, associated with or integral to a binding  
reagent for an analyte of interest, thereby forming a  
binding surface containing said binding reagent linked to  
said support via an A:B linkage, said binding surface being  
organized as said plurality of discrete binding domains  
containing said binding reagents capable of binding to an  
analyte of interest.

<sup>60</sup> 108. The apparatus of claims <sup>9</sup> ~~17~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~, <sup>34</sup> ~~83~~ or <sup>35</sup> ~~87~~, wherein  
said binding domains are hydrophilic or hydrophobic relative to  
the surface of the support.

61<sup>21, 33, 37</sup>~~109~~. The apparatus of claims ~~30~~, ~~82~~ or ~~86~~, wherein said binding domains are hydrophilic or hydrophobic relative to the surface of the electrode.

62<sup>9, 21, 22, 33, 34</sup>~~110~~. The apparatus according to claims ~~11~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, <sup>35, 37, 38, 39</sup>~~83~~, ~~85~~, ~~86~~ or ~~87~~, further comprising a domain that comprises an internal standard.

63<sup>32, 35, 77, 34, 78</sup>~~111~~. The apparatus of claims ~~80~~, ~~83~~, ~~85~~, ~~86~~ or ~~87~~, wherein said support, binding domains and electrodes are substantially transparent.

64<sup>21, 32, 33, 34</sup>~~112~~. The apparatus of claims ~~30~~, ~~80~~, ~~81~~ or ~~82~~, wherein said binding domains and said electrode are substantially transparent.

65<sup>32, 33</sup>~~113~~. The apparatus of claims ~~80~~ or ~~81~~, wherein said binding domains and said support are substantially transparent.

66<sup>35, 36, 37, 39</sup>~~114~~. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said electrodes are separately addressable by at least one source of electrical energy.

67<sup>1, 2, 3, 4, 9, 21, 32, 33</sup>~~115~~. The apparatus of claims ~~1~~, ~~2~~, ~~3~~, ~~4~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~, <sup>34, 35, 36, 37, 38, 39</sup>~~82~~, ~~83~~, ~~84~~, ~~85~~, ~~86~~ or ~~87~~, wherein said light detector comprises film.

68<sup>9, 21, 32, 33, 34, 35, 36, 37</sup>~~116~~. The apparatus of claims ~~11~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~ or <sup>38</sup>~~87~~, wherein said light detector is capable of simultaneously measuring electrochemiluminescence from said binding domains and

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capable of distinguishing electrochemiluminescence emitted from different binding domains.

<sup>69</sup> 117. The apparatus of claims 1, 2, <sup>7</sup> ~~8~~, <sup>8</sup> ~~11~~, <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~,  
<sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>36</sup> ~~84~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~ or <sup>39</sup> ~~87~~, wherein said light detector comprises a photomultiplier.

<sup>70</sup> 118. The apparatus of claims 1, 2, <sup>7</sup> ~~8~~, <sup>8</sup> ~~11~~, <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~,  
<sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>36</sup> ~~84~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~ or <sup>39</sup> ~~87~~, wherein said electrochemiluminescence is imaged by using a photodiode.

<sup>71</sup> 119. The apparatus of claims 1, 2, <sup>7</sup> ~~8~~, <sup>8</sup> ~~11~~, <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~,  
<sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>36</sup> ~~84~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~ or <sup>39</sup> ~~87~~, wherein said electrochemiluminescence is imaged by using a photodiode array.

<sup>72</sup> 120. The apparatus of claims 1, 2, <sup>7</sup> ~~8~~, <sup>8</sup> ~~11~~, <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~,  
<sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>36</sup> ~~84~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~ or <sup>39</sup> ~~87~~, wherein said electrochemiluminescence is imaged by using a CCD array.

<sup>73</sup> 121. The apparatus of claims 1, 2, 9, 11, 17, 30, 80, 81, 82, 83, 84, 85, 86 or 87, wherein said electrochemiluminescence is imaged by using a CMOS array.

<sup>74</sup> 122. The apparatus of claims 1, 2, <sup>7</sup> ~~8~~, <sup>8</sup> ~~11~~, <sup>9</sup> ~~17~~, <sup>21</sup> ~~30~~, <sup>32</sup> ~~80~~, <sup>33</sup> ~~81~~,  
<sup>34</sup> ~~82~~, <sup>35</sup> ~~83~~, <sup>36</sup> ~~84~~, <sup>37</sup> ~~85~~, <sup>38</sup> ~~86~~ or <sup>39</sup> ~~87~~, wherein said electrochemiluminescence is imaged by using an array of light detectors.

<sup>75</sup> 123. The apparatus of claims 1, 17, 80, 81 or 83, wherein said support comprises a conductive layer and said metallic layer provides said electrode.

76 <sup>9 72 33 35</sup>124. The apparatus of claims ~~17~~, ~~80~~, ~~81~~ or ~~83~~, wherein said support comprises meshes, felts, fibrous materials, gels, elastomers or mixtures thereof.

77 <sup>7 8 9 21 72 33 34</sup>125. The apparatus of claims 1, ~~8~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises carbon nanotubes, carbon black, carbon nanotubes in a matrix, carbon black in a matrix or combinations thereof.

78 <sup>75 36 37 39</sup>126. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said electrodes comprise carbon nanotubes, carbon black, carbon nanotubes in a matrix, carbon black in a matrix or combinations thereof.

79 <sup>7 8 9 21 32 33</sup>127. The apparatus of claims 1, 2, ~~8~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises carbon nanotubes.

80 <sup>35 36 37 39</sup>128. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said electrodes comprise carbon nanotubes.

81 <sup>7 8 9 21 32 33</sup>129. The apparatus of claims 1, 2, ~~8~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises carbon nanotubes dispersed in a matrix.

82 <sup>75 36 37 39</sup>130. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said electrodes comprise carbon nanotubes dispersed in a matrix.

83 <sup>9 32 33 35</sup>131. The apparatus of claims ~~17~~, ~~80~~, ~~81~~ or ~~83~~, wherein said support comprises graphite, glassy carbon or carbon black.



84<sup>9 32 33 35</sup>~~132~~. The apparatus of claims ~~11~~, ~~80~~, ~~81~~ or ~~83~~, wherein said support comprises graphitic carbon nanotubes.

85<sup>9 32 33 35</sup>~~133~~. The apparatus of claims ~~11~~, ~~80~~, ~~81~~ or ~~83~~, wherein said support comprises carbon particles dispersed in a matrix.

86<sup>32 33 34 38</sup>~~134~~. The apparatus of claims ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises graphite, glassy carbon or carbon black.

87<sup>35 36 37 39</sup>~~135~~. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said plurality of electrodes comprise graphite, glassy carbon or carbon black.

88<sup>7 8 9 11 30 32 33 34 38</sup>~~136~~. The apparatus of claims 1, 2, ~~8~~, ~~11~~, ~~11~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises carbon particles dispersed in a matrix.

89<sup>35 36 37 38</sup>~~137~~. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, wherein said electrodes comprise carbon particles dispersed in a matrix.

90<sup>7 8 9 11 32 33 34 38</sup>~~138~~. The apparatus of claims 1, 2, ~~8~~, ~~11~~, ~~11~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~ or ~~86~~, wherein said electrode comprises functionalized carbon nanotubes.

91<sup>33</sup>~~139~~. The apparatus of claims 1 or ~~81~~, further comprising conductive projections from the surface of said support, said conductive projections capable of acting as said electrodes for generating electrochemiluminescence.

92<sup>7 11 32 33 34 35 37 38</sup>~~140~~. The apparatus of claims ~~11~~, ~~30~~, ~~80~~, ~~81~~, ~~82~~, ~~83~~, ~~85~~, ~~86~~ or ~~87~~, wherein said binding domains are contained in a single

chamber capable of containing a single fluid in contact with two or more of said binding domains.

<sup>7 8 21 32 33 34 38</sup>  
~~93~~ <sup>141</sup>. The apparatus of claims ~~9, 11, 30, 80, 81, 82~~ or ~~86~~, wherein said electrode is porous.

<sup>7 8 21 32 33 34 38</sup>  
~~94~~ <sup>142</sup>. The apparatus of claims ~~9, 11, 30, 80, 81, 82~~ or ~~86~~, wherein said electrode is a flow-through electrode.

<sup>35 36 37 39</sup>  
~~95~~ <sup>143</sup>. The apparatus of claims ~~83, 84, 85~~ or ~~87~~, wherein said electrodes are porous.

<sup>35 36 37 39</sup>  
~~96~~ <sup>144</sup>. The apparatus of claims ~~83, 84, 85~~ or ~~87~~, wherein said electrodes are flow-through electrodes.

<sup>7 8 9 21 32 33 34 35</sup>  
~~97~~ <sup>145</sup>. The apparatus of claims ~~9, 11, 17, 30, 80, 81, 82, 83~~, <sup>36 37</sup>  
~~84~~ or ~~85~~, further comprising a counterelectrode.

<sup>9 11 32 33 35 36 38 39</sup>  
~~98~~ <sup>146</sup>. The apparatus of claims ~~17, 30, 80, 81, 83, 84, 85, 86~~ or <sup>39</sup>  
~~87~~, wherein one or more binding domains contain binding reagents of different specificity than those contained in other binding domains.

<sup>9 21 32 33 34 35 36</sup>  
~~99~~ <sup>147</sup>. The apparatus of claims ~~17, 30, 80, 81, 82, 83, 84~~, <sup>37 38 39</sup>  
~~85, 86~~ or ~~87~~, wherein said binding domains comprise predetermined amounts of binding reagents.

<sup>7 8</sup>  
~~100~~ <sup>148</sup>. The apparatus of claims 1, 2, ~~9~~ or ~~11~~, wherein said binding reagent is present in a predetermined amount.

<sup>1</sup> <sup>8</sup> <sup>9</sup> <sup>21</sup> <sup>32</sup> <sup>33</sup>  
<sup>101</sup> ~~149~~. The apparatus of claims 2, ~~8~~, ~~11~~, ~~17~~, ~~30~~, ~~80~~, ~~81~~ or  
<sup>34</sup> ~~82~~, further comprising a counterelectrode in a fixed position  
relative to said electrode.

<sup>25</sup> <sup>26</sup> <sup>27</sup> <sup>38</sup>  
~~102~~ ~~150~~. The apparatus of claims ~~83~~, ~~84~~, ~~85~~ or ~~87~~, further  
comprising a plurality of counterelectrodes to form a plurality  
of electrode-counterelectrode pairs.

<sup>28</sup> <sup>30</sup>  
~~103~~ ~~151~~. The kit of claims ~~61~~ or ~~63~~, wherein said binding  
domains are contained in a single chamber capable of containing  
a single fluid in contact with two or more of said binding  
domains.

<sup>28</sup> <sup>30</sup>  
~~104~~ ~~152~~. The kit of claims ~~61~~ or ~~63~~, wherein said binding  
domains are contained in a single chamber capable of  
containing a single fluid in contact with two or more of said  
binding domains and said single chamber contains said reagent.

<sup>28</sup>  
~~105~~ ~~153~~. The kit of claim ~~61~~, wherein said support comprises a  
material selected from the group consisting of meshes, felts,  
carbon nanotubes, carbon black, porous materials, mats or  
mixtures thereof.

<sup>30</sup>  
~~106~~ ~~154~~. The kit of claim ~~63~~, wherein said electrode comprises  
a material selected from the group consisting of meshes, felts,  
carbon nanotubes, carbon black, porous materials, mats or  
mixtures thereof.

<sup>28</sup>  
~~107~~ ~~155~~. The kit of claim ~~61~~, wherein said support comprises:

- (a) conducting polymers;
- (b) conductive particles dispersed in a matrix;
- (c) conductive fibers;
- (d) a patterned self-assembled monolayer; or
- (e) mixtures thereof.

*BP 4*  
*cont*  
~~108~~ <sup>30</sup> 156. The kit of claim ~~63~~, wherein said electrode comprises:

- (a) conducting polymers;
- (b) conductive particles dispersed in a matrix;
- (c) conductive fibers;
- (d) a patterned self-assembled monolayer; or
- (e) mixtures thereof.

~~109~~ <sup>28</sup> <sup>30</sup> 157. The kit of claims ~~61~~ or ~~63~~, wherein said electrochemiluminescent label comprises an organometallic compound.

~~110~~ <sup>28</sup> <sup>30</sup> 158. The kit of claims ~~61~~ or ~~63~~, wherein said electrochemiluminescent label comprises an organometallic compound selected from the group consisting of Ru-containing and Os-containing organometallic compounds.

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